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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,446	03/25/2004	Edward Raymond Dowski JR.	420228	8923

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EXAMINER

HARRINGTON, ALICIA M

ART UNIT	PAPER NUMBER
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2873

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/810,446

Applicant(s)

DOWSKI, EDWARD RAYMOND

Examiner

Alicia M. Harrington

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 March 2004 and 08 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 26-29 is/are allowed.
- 6) ☒ Claim(s) 1-12, 14-17 and 20-22, 25 is/are rejected.
- 7) ☒ Claim(s) 13, 18, 19, 23 and 24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claim 17 is objected to because of the following informalities: 35 C.F.R. requires the claims to be listed in order and refer to a previous claim when in dependent form. Claim 17 refers to claim 18. Appropriate correction is required.
2. Claim 18 is objected to because of the following informalities: claim 18 depends from itself. Appropriate correction is required.
3. Applicant is advised that should claim 10 be found allowable, claim 15 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claims 4, 5, 9, 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 describes a circularly symmetric filter with the claimed phase function. However, the variables A, B, r and theta are not defined in the claim. Thus, the claim is indefinite

Claim 9 describes a phase function of the optical phase filter. However, the variables P, D, x and y are not defined in the claim. Thus the claim is indefinite.

Claim 20 recites the limitation ""the characteristic" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

Claims 4,5,9 and 20 will be examined as best understood by the Examiner.

Claim 5 inherits its indefiniteness from claim 4 from which it depends.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1,2,6-8, 14, 20-22, 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshida et al (US 5,233,431).

Regarding claim 1, Yoshida discloses an optical imaging system to variably control image properties of an image, comprising: at least one optical phase filter (10;col. 2, lines 25-35); and

a controller (for example 46) for positioning the optical phase filter to alter phase of a wave front of the imaging system to select the properties of the image (see col. 2, lines 40-53 and col. 4, lines 15-23).

Regarding claim 2, Yoshida discloses the optical imaging system of claim 1, the image properties comprising one or more of depth of focus, aberration tolerance and aliasing properties (col. 2, lines 15-35).

Regarding claim 6, Yoshida discloses the optical imaging system of claim 1, the controller comprising a motor (see col. 4, lines 20-25).

Regarding claim 7, Yoshida discloses the optical imaging system of claim 1, the controller translating the optical phase filter between at least two positions (different angles) wherein the wave front passes through at least two separate portions (lenticular sheet) of the optical phase filter (see col. 4, lines 15-69 and col. 5, lines 40-69).

Regarding claim 8, Yoshida discloses the optical imaging system of claim 1, the controller rotating the optical phase filter about an optical axis to effect phase changes to the wave front (see col. 4, lines 18-67).

Regarding claim 14, Yoshida discloses a controller comprises an automatic motor and controller (see col. 5, lines 35-67).

Regarding claim 20, Yoshida discloses the optical imaging system of claim 1, the characteristics of the image comprising one or more of depth of focus, depth of field, aliasing properties, and aberration tolerance (see col. 2, lines 15-35).

Regarding claims 21, Yoshida discloses the optical imaging system of claim 1, further comprising means for adjusting one or both of aperture and focal length of

the system, the controller repositioning the optical phase filter so that the imaging properties remain substantially fixed irrespective of the means for adjusting (see abstract-see col. 6, lines 20-32).

Regarding claim 22, Yoshida discloses a method for variably affecting the wave front of an optical system to selectively control imaging properties, the method comprising the steps of: positioning one or more optical phase filters (10; col. 2, lines 25-35 and 45-55) in the optical system, and repositioning the optical phase filters to affect the imaging properties (col. 5, lines 35-67).

Regarding claim 25, Yoshida discloses the method of claim 22, further comprising adjusting one or both of focus and aperture of the imaging system, the step of repositioning comprising repositioning the optical phase filters to counter imaging effects associated with the step of adjusting one or both of focus and aperture (col. 4, lines 15-67 and col. 5, lines 16-25).

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States

and was published under Article 21(2) of such treaty in the English language.

9. Claims 1,2, 4,10-12,15-17, 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Cathey, Jr. et al (Us 2004/0165253).

Regarding claim 1, Cathey discloses an optical imaging system to variably control image properties of an image, comprising: at least one optical phase tilter (102); and

a controller (system designer) for positioning the optical phase filter to alter phase of a wave front of the imaging system to select the properties of the image (see section 18,21,22).

Regarding claim 2, Cathey discloses the optical imaging system of claim 1, the image properties comprising one or more of depth of focus, aberration tolerance and aliasing properties (see section 21).

Regarding claim 4, Cathey the system of claim 1, the optical phase filter comprising a circularly symmetric phase form of $P(r,0) = A(r,0) + B(r)$ -see section 22.

Regarding claim 10, Cathey discloses the optical imaging system of claim 1, the optical phase filter being disposed proximal to one of an aperture stop of the optical system and an image of the aperture stop (see section 22).

Regarding claim 11, Cathey discloses the optical imaging system of claim 1, further comprising (a) a detector for capturing an image of the object (106) and (b) a post processor (108,110) for processing data from the detector to reverse effects induced by the optical phase filter (see section 20,21).

Regarding claim 12, Cathey discloses the optical imaging system of claim 11, wherein the post processor comprises a digital filter (see section 20).

Regarding claim 15, Cathey discloses the optical imaging system of claim 1, wherein the optical phase filter is disposed proximal to one of an aperture stop of the optical system and an image of the aperture stop (see section 22).

Regarding claim 16, Cathey disclose the optical imaging system of claim 1, wherein the optical phase filter comprises a phase mask (see section 18).

Regarding claim 17, Cathey discloses the optical imaging system of claim 18, wherein the phase mask implements a phase function of the form: $P(r,0)c = [2\cos(3)] \propto r^3 \cos(3\theta)$ -see section 22.

Regarding claim 20, Cathey discloses the optical imaging system of claim 1, the characteristics of the image comprising one or more of depth of focus, depth of field, aliasing properties, and aberration tolerance (see section 21).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3,9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cathey et al (US 2004/0165253).

Regarding claims 3 and 9, Cathey discloses the optical imaging system of claim 1, with a two dimensional phase filter having a two dimensional phase function (see section 18,19,22). Cathey fails to specifically disclose the at least one optical phase filter comprising first and second optical filters. Thus, Cathey discloses the claimed invention except for a first and second filter. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a first and second phase filter, since it has been held that constructing a formerly integral structure in various elements involves only routine skill in art. One would have been motivated to make the elements separable for the purpose of ensuring the phase change of the wave in either direction of propagation (orthogonal propagations). In re Dulberg, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961). Therefore, it would have been further obvious to have a 2-step phase function to define each filter.

11. Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cathey et al (US 2004/0165253) in view of Jackson (US 5,322,998)

Regarding claim 5, Cathey discloses the optical imaging system of claim 4, and the optical phase filter (104) may comprise optics. However, Cathey fails to specifically disclose the optical phase filter comprising aspheric optical elements.

In the same field of endeavor, Jackson discloses an aspheric optical element (24) that produces a blurred image on the imager (see col. 3). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include an aspherical element, since Jackson teaches

aspherical blur filters are known in the art, they are less complicated to make, and have a tightly controlled blur pattern which makes processing easier.

Allowable Subject Matter

12. Claims 26-29 are allowed.
13. Claims 13, 23,24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
14. Claims 18,19 would be allowable if rewritten to overcome the claim objection set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
15. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 13, prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the dependent claims, in such manner that a rejection under 35 U. S.C 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims, which at least include the optical imaging system of claim 1, further comprising a user interface for selecting en a magnitude of at least one of the image properties and a controller, responsive to user selections at the interface, to direct the controller to position the optical phase filter and affect the magnitude as claimed.

Regarding claim 18, prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the dependent claims, in such

manner that a rejection under 35 U. S.C 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims, which at least include wherein the phase mask implements a cubic phase function when moved by the means for moving.

Regarding claims 23 and 26, prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the dependent claims, in such manner that a rejection under 35 U. S.C 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims, which at least include the method of claim 22, further comprising the step of capturing images from the system and post-processing a digital representation of the images to reverse the effects induced by the optical phase filter as claimed.

Regarding claim 29, prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the dependent claims, in such manner that a rejection under 35 U. S.C 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims, which at least include the step of post-processing data from a detector of the optical system to reverse the effects induced by the optical phase filter and achieve selected image properties as claimed.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

George et al (US 2003/0142877) discloses an imaging using a multi-focal aspheric lens to obtain extended depth of field;

Chen (US 6,091,548) discloses an optical system with two-stage aberration correction;

Jackson (US 5,438,366) discloses an aspherical blur filter for reducing artifacts in imaging apparatus and

Clark (US 6,307,680) discloses an optical blurring filter which is resistant to digital image restoration.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia M. Harrington whose telephone number is 571 272 2330. The examiner can normally be reached on Monday - Thursday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571 272 2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



AMH

Alicia M Harrington
Examiner
Art Unit 2873